Better Buildings® U.S. DEPARTMENT OF ENERGY

Better Plants® U.S. DEPARTMENT OF ENERGY

Waste Reduction Pilot

Q1 Webinar, Business Case

Wednesday February 17, 2021

2 – 3 pm EST

U.S. DEPARTMENT OF ENERGY

Waste Reduction Pilot

Quarterly calls: What do we hope to get out of them?

- Spotlight Leadership
- Share Best Practices
- Present Valuable Resources
- Provide a Forum to Share Challenges and Opportunities

Agenda

1. Introduction & Waste Reduction Pilot Program Updates
2. Heidi Frasure – Sustainability Team Leader
   Steelcase
3. Brie Fulton – Sustainability Program Manager, Berkeley Lab
4. Q&A and Resources

Thank you, Waste Pilot Participants

Industrial

- Armstrong Flooring
- AstraZeneca
- Bristol-Myers Squibb
- Cooper Standard
- Cummins, Inc.
- Electrolux
- Estée Lauder
- Flowers Foods
- FMC Chemicals
- General Motors
- Gibraltar Industries
- Graham Packaging
- HARBEC
- Honda North America
- Johnson Controls
- KYB Americas

Industrial

- Lockheed Martin
- Los Angeles Department of Water and Power
- Martin Guitar
- Nissan North America
- NSK Americas
- PaperWorks Industries
- PPC Online
- Schneider Electric
- Steelcase, Inc.
- Sugar Creek Packing Co.
- Raytheon Technologies
- Valmont Industries
- Volvo Group North America

Commercial

- Bozzuto Management Company
- City of Reno, NV
- CommonWealth Partners
- The Hartford Financial Services Group
- Jamestown, LP
- Lawrence Berkeley National Laboratory
- Montefiore Medical Center
- New Bedford Housing Authority
- Parkway
- Shorenstein Properties, LLC
- Sprint
- Tenderloin Neighborhood Development Corp.
- The Tower Companies
- USAA Real Estate
- UW Health
- The West Palm Beach VA Medical Center*
- DWS

*(part of the U.S. Dept. of Veterans Affairs' Sunshine Healthcare Network)

Welcome New Partners to the Pilot!

Industrial

KYB®

ESTĒE LAUDER COMPANIES

Commercial

DWS

Waste Pilot Team

DOE

- Robert Bruce Lung, Senior Technical Advisor, BGS LLC, AMO
- Eli Levine, AMO
- Ethan Rogers, AMO
- Hannah Debelius, ORISE Fellow, BTO

ICF

- Clifton Yin, embedded in AMO

RE Tech Advisors

- Andrea Doukakis, embedded in BTO

Program Updates

DATA – Corporate level data is due March 1st (BBC partners use portfolio manager, Better Plants partners use reporting form)

Next quarterly call in the **Summit** – Registration opened on 2/16/21

Monthly email bulletins and other resources on our home page

Working Groups Update

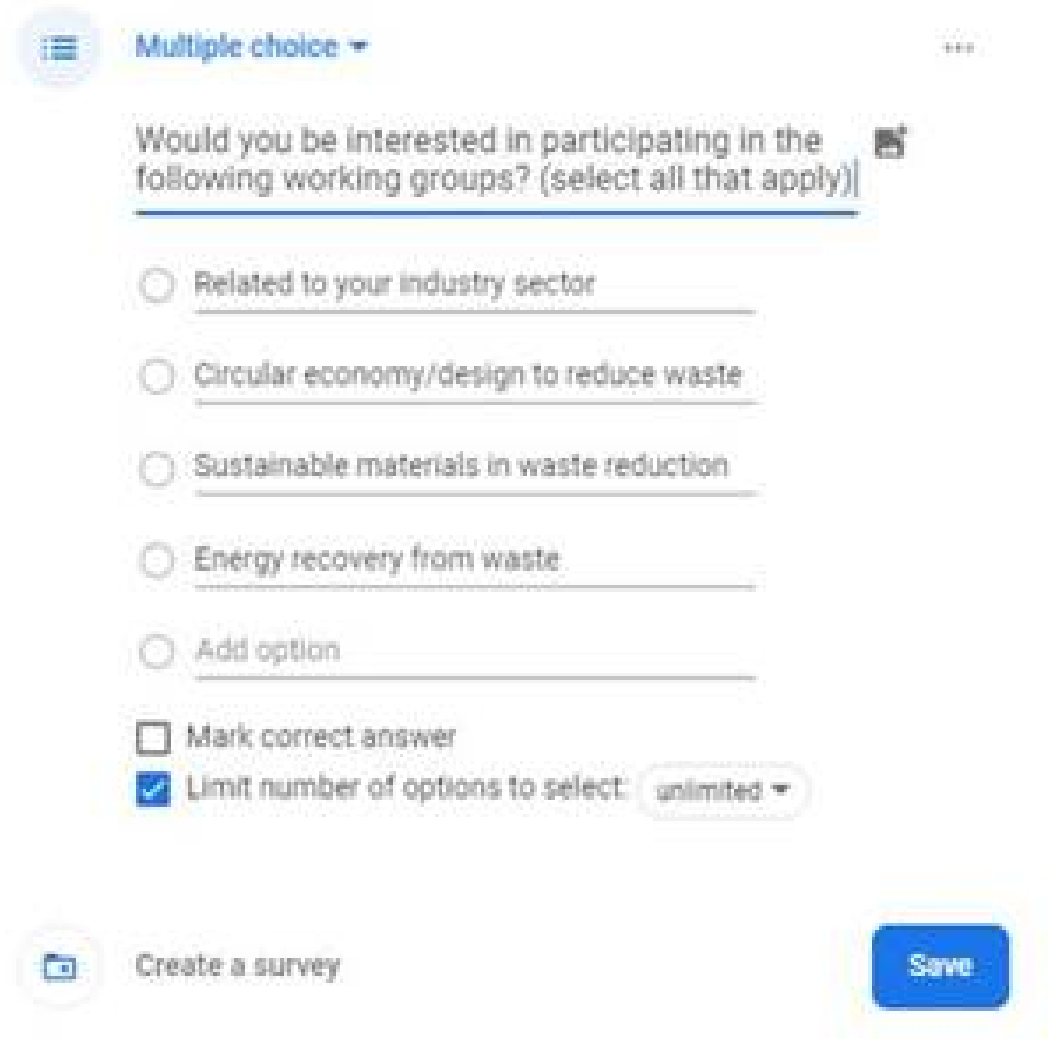
Plastics

- Focused on plastic reduction, recycling, and reuse
- 2 calls held. Our 3rd and last call is on Feb 24 and will feature a speaker from the American Chemistry Council. Reach out to Bruce if you'd like more information

Outreach & Engagement

- Focused on outreach, education, and engagement of building occupants for waste reduction and diversion
- This working group is now closed. Please see the "Top 5 Waste Outreach & Engagement Tips" fact sheet for findings from the working group.

Poll: Working Groups



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Enter Event Code

#WASTE

Robert Bruce Lung

Senior Technical Advisor, BGS-LLC

Today's topic:

Making the Business Case for Waste Reduction/Recycling

U.S. DEPARTMENT OF ENERGY

Poll: Making The Business Case

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#WASTE

Today's Presenters

Heidi Frasure
Steelcase

Brie Fulton
Lawrence Berkeley National Laboratory

Heidi Frasure

Sustainability Team Leader

Steelcase

Steelcase

The Business Case for Reducing Waste

February 2021

Steelcase

Who are we?

Our purpose is to unlock human promise—it is fundamentally grounded in Sustainability

Environmental

Healthy Planet

Create products and operations that are good for the world.

Social

Healthy People

Cultivate opportunities for people and communities to thrive.

Governance

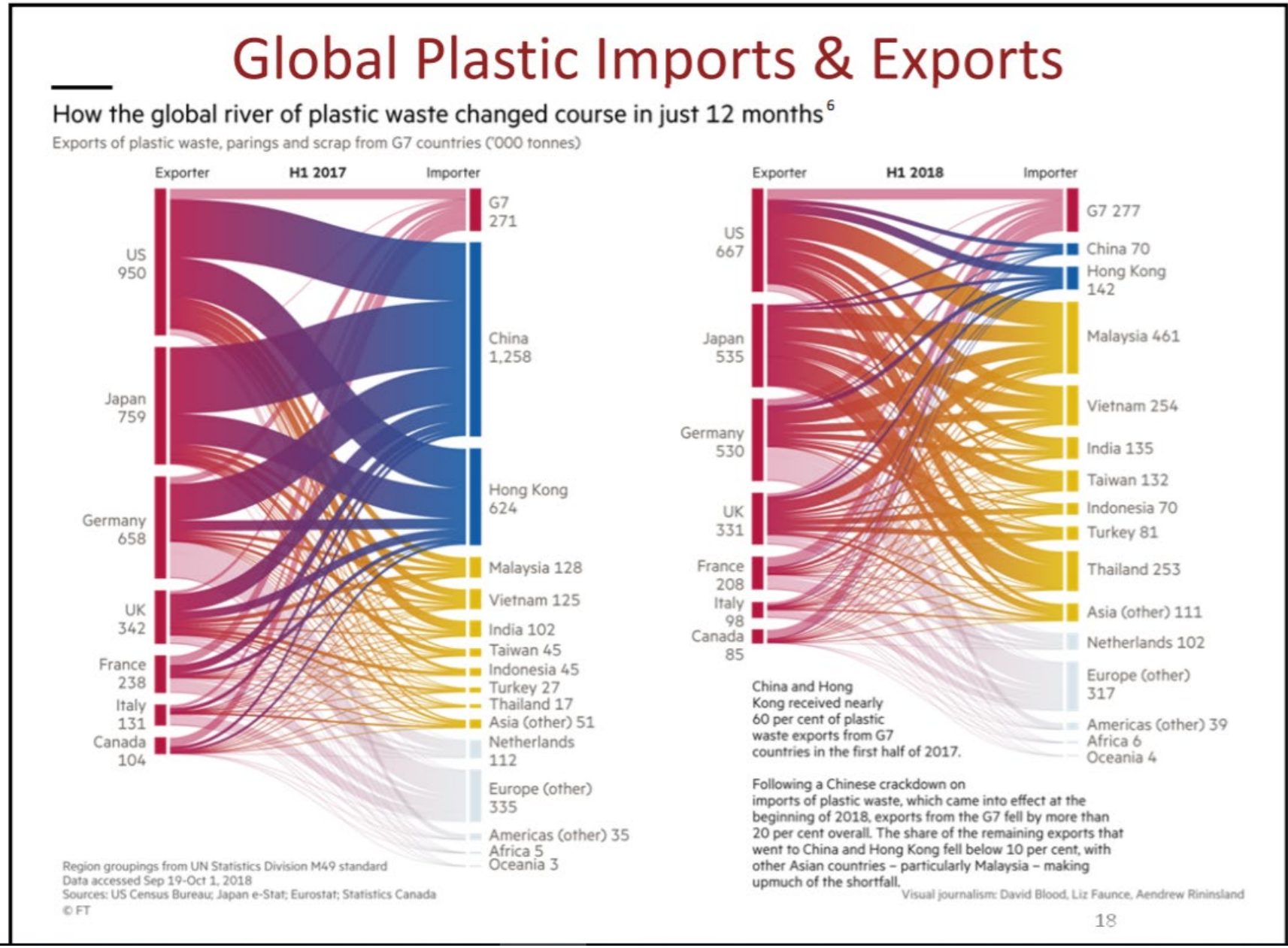
Healthy Culture

Curate a culture of trust and integrity.

- Business Case
- for Reducing
- Waste

Historically recycling materials from our own manufacturing process was economical and fairly simple…

Until 2018…



Source: https://www.researchgate.net/figure/6-How-the-Global-River-of-Plastic-Waste-Changed-Course-in-just-12-Months_fig4_338687511

Focus Areas

What materials still have value in recycling? How do we get the highest value for these commodities?
- Shrink wrap/plastic wrap
- Cardboard
- Metals
- Pallets

Are there opportunities to donate scrap materials?
- Fabric

Who are the partners we should be working with that can help support?
- Changed vendors for recycling
- Added new vendors
- Expanded donation networks

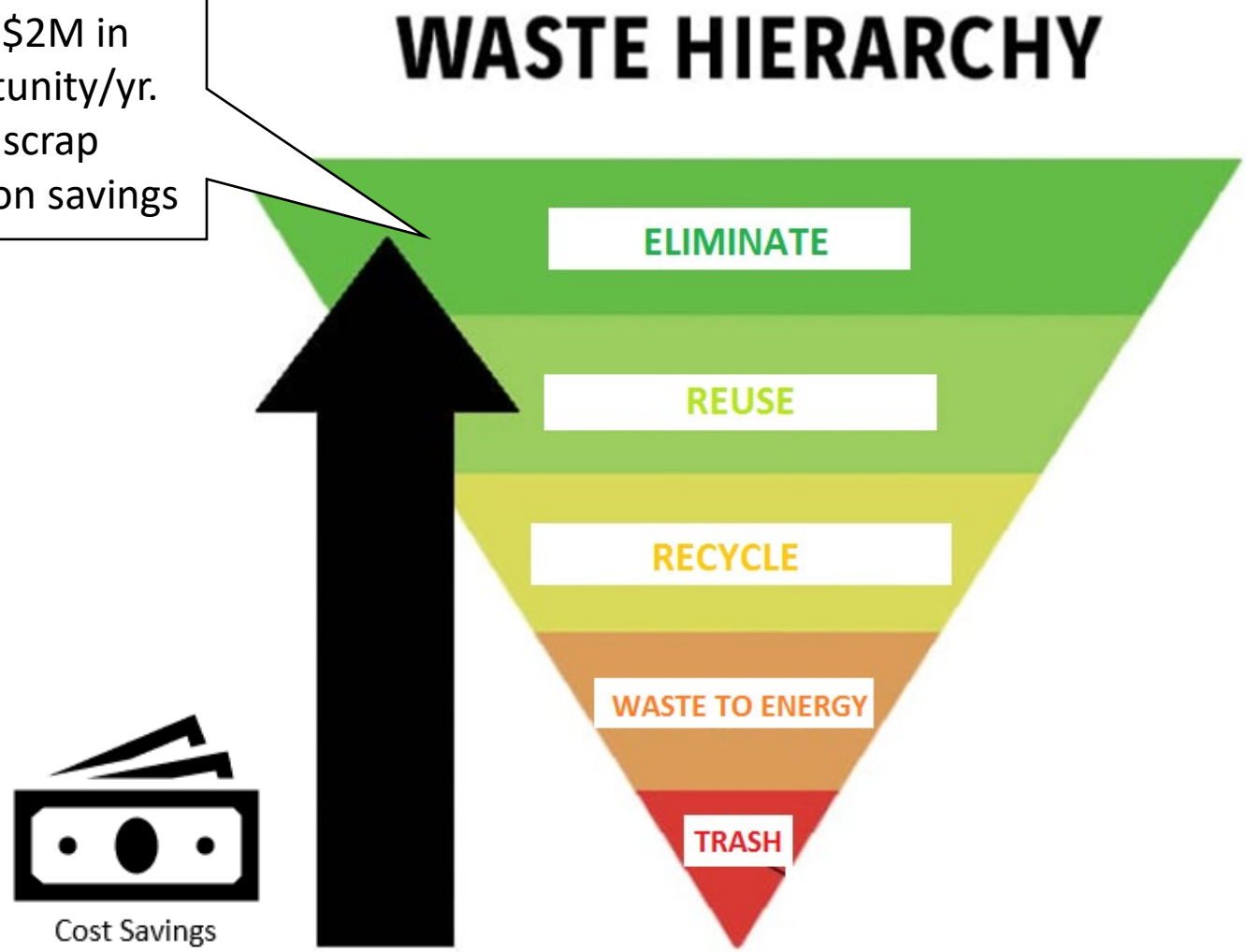
How can we help our customers?
- Hack the Pack
- Pilot studies
- Dealer consulting
- Fabric donations for rugs

Eliminate the Waste in the First Place

Focus on the commodities you are sourcing and manage them more responsibly. This is where the big $$$ cost savings resides. Better utilizing sourced materials not only helps save money, but it also prepares us for a resource scarce world and the negative impacts from Climate Change on our continued ability to source the commodities we need to do business.

This goes beyond zero waste to landfill goals, it's about survival.

In one of our plants, there was over $2M in opportunity/yr. for scrap reduction savings



Focus on materials that still have a value in the recycling market, to offset other costs to recycle…

Examples

Through partnerships we were able to find outlets for materials that were otherwise destined for landfill. In doing so we were able to create a revenue stream from these commodities and save in landfill costs, totaling to over $100K/yr.

By focusing on the business case and using a simple ROI calculation we were able to gain buy-in from leadership to make decisions that impacted operations and build new collaborative partnerships.

Shrink Wrap/Plastic Wrap

We started baling all plastic wrap and set up a drop trailer solution with Trex Decking. When the trailer is full of bales, Trex coordinates a pickup, and hauls free of charge. They use the plastic as a feedstock for new decking products.

Cardboard

We started baling all cardboard and negotiated a relationship with Pratt Paper to go direct to the papermill. This bypasses local recyclers and allows for Steelcase to receive market value for the cardboard bales. Pratt utilizes 100% recycled content in their products, some of which Steelcase buys back to use as packaging material.

Local Donations

Reaching out to local non-profits to see if they have any interest in waste streams or scrap has added value to not only Steelcase but also our communities in which we do business. In the Grand Rapids area we have donated over 300 tons of fabric to local partners like public thread, who makes new products from our waste. Some of which we have purchased back to use as customer gifts. Donating materials saves in landfill costs and provides feedstock to support our local communities.

Packaging Projects

We wanted to not only focus on our own waste in our manufacturing processes, but also try to improve the recyclability of the packaging we are sending to our customers. We started a journey we call “Hack the Pack” that is a collaborative effort to rethink how we design packaging solutions to be more sustainable, while also maintaining the integrity of the product through transport. In this journey we have had several win-win-win opportunities where we not only found more sustainable solutions, but we also saved money in doing so while maintaining the product quality.

Hack the Pack

We are also focused on improving the recyclability of our packaging materials and have found that there are cost savings opportunities in doing so. We have found over $1M/year in cost savings opportunities by switching from foam to fiber-based packaging.

We are constantly looking for win-win-win opportunities, keeping sustainability, quality and costs in mind.

Before

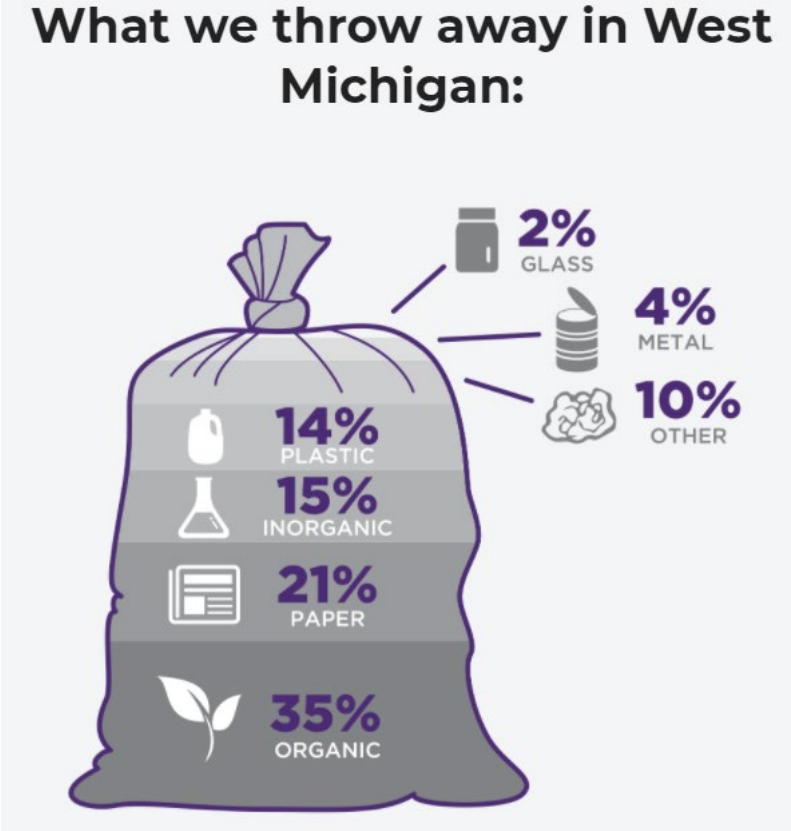
After

Donations & Community Partners

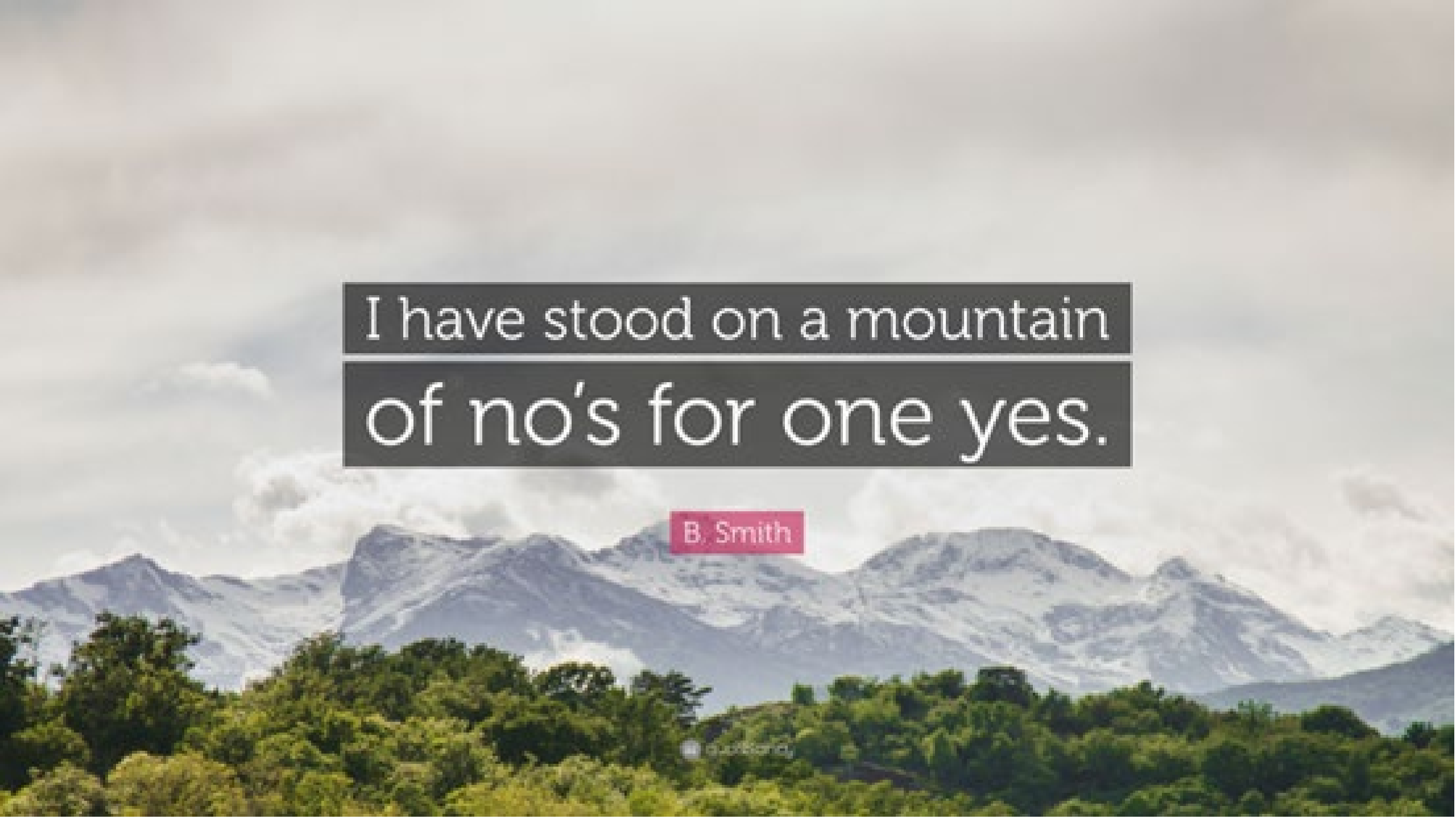
Develop networks and relationships with local community partners. Donations are typically cost neutral or can be a cost savings by reducing disposal costs. They also serve to better our local community and businesses.

Advocacy

Don’t forget to advocate for better resources to do what is right. Composting is typically a cost savings. If sustainable solutions are not available in your community, you can have a seat at the table as a local business to advocate and negotiate for more sustainable and cost friendly alternatives to landfill.

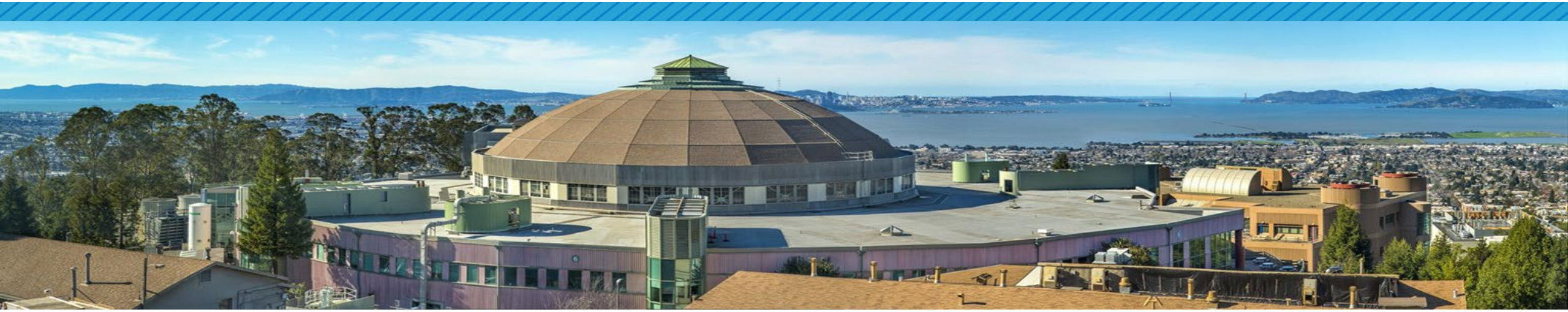


Source: http://www.reimaginetrash.org/


I have stood on a mountain
of no's for one yes.
B. Smith

Brie Fulton
Sustainability Program Manager
Berkeley Lab

Building Building Tactics to Zero Waste



Brie Fulton | February 17, 2021

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BERKELEY LAB

SBL Waste Program Priorities

Improve Data

- Obtain accurate Waste Diversion by Site and Building
- Find out what is in the bin
- Learn about contamination and sorting habits

Meet Goals

- Zero Waste: > 90% of waste must be diverted from the landfill
- Reduce waste generation by 50% per capita from 2016/2017 levels by 2030

Program Resources

- Central 4-bin waste stations in every building with good bin signage
- Online “Waste Guide” shows people how to sort & explains what happens beyond the bin

Closing the Gap

- How to close the green gap?
  - Focus on the biggest opportunity
  - Waste from buildings
  - Current hauler gives weights quarterly
    - This leaves a lot of unanswered questions
    - Audits give us answers we need

Incentives Built into the Contract

- Waste hauling contract incentivises waste diversion
  - Existing recycling grandfathered in- no cost
  - Composting costs less than landfill

Waste Audits

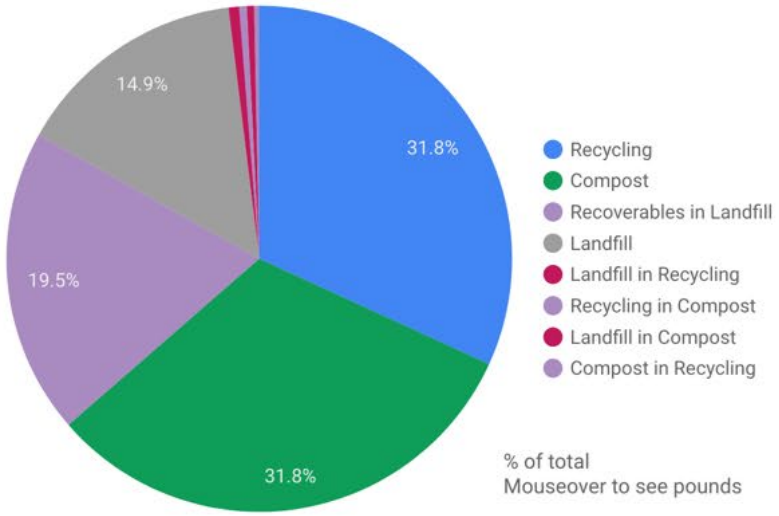
External View of Audit Results

Waste Diversion: The goal is >90% by 2020

Diversion at Berkeley Lab

Percent Diverted Correctly
64%

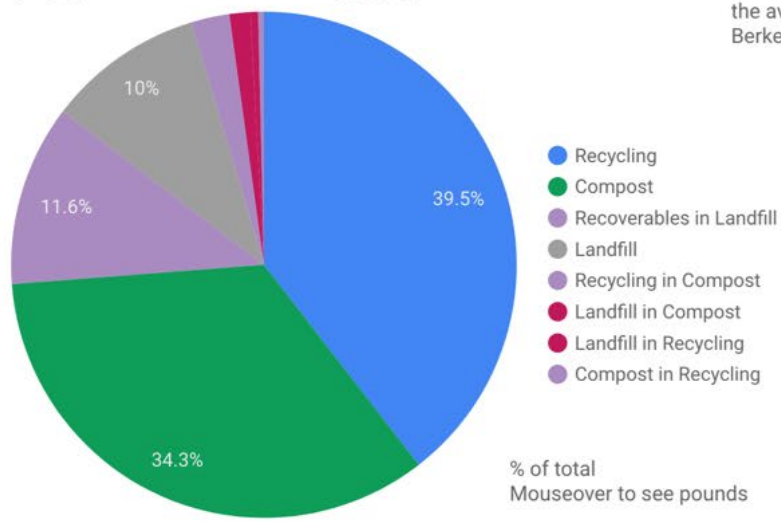
Percent that Could be Diverted
84%



Diversion by Building

Percent Diverted Correctly
74%

Percent that Could be Diverted
88%

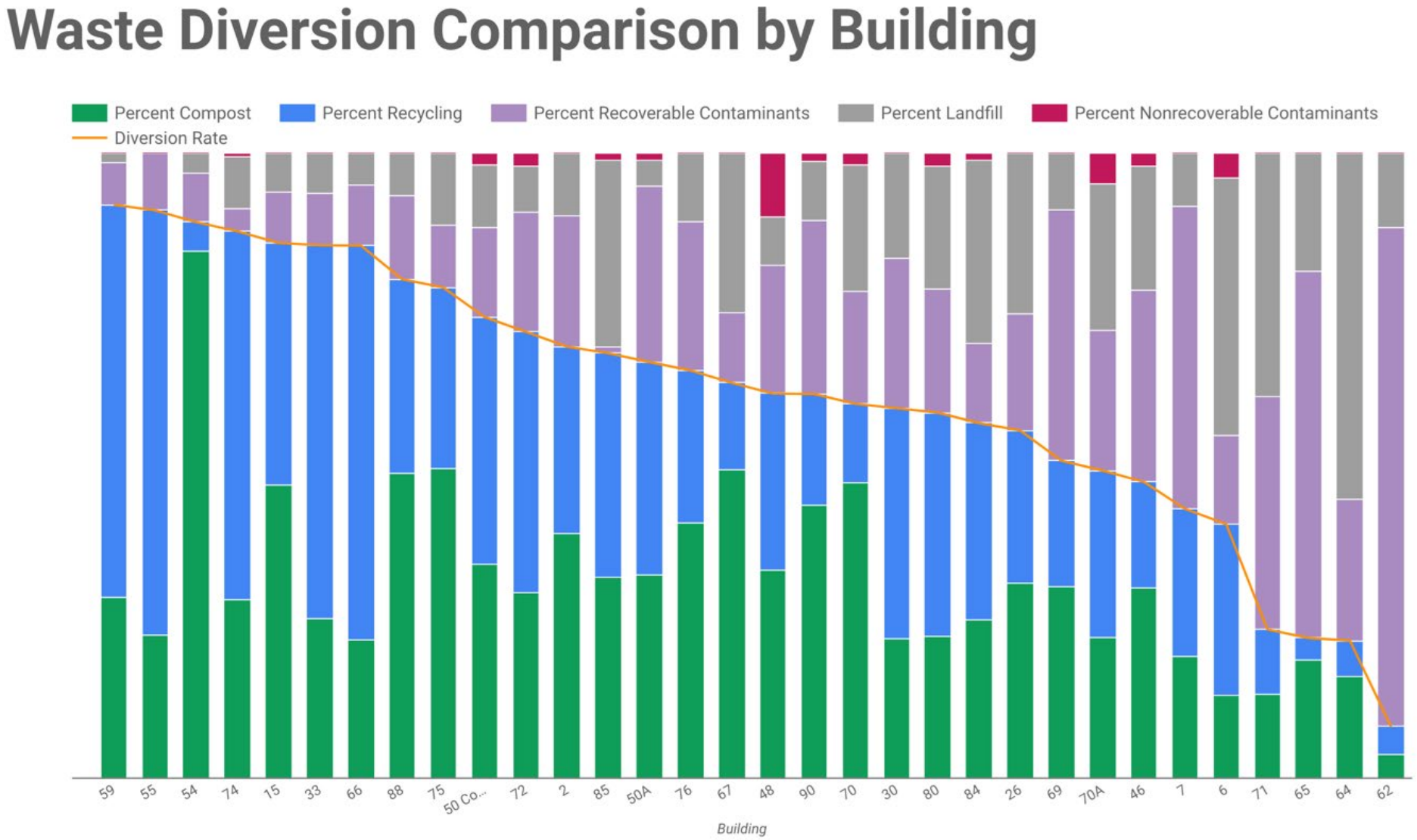


Building: 50 C... (1)

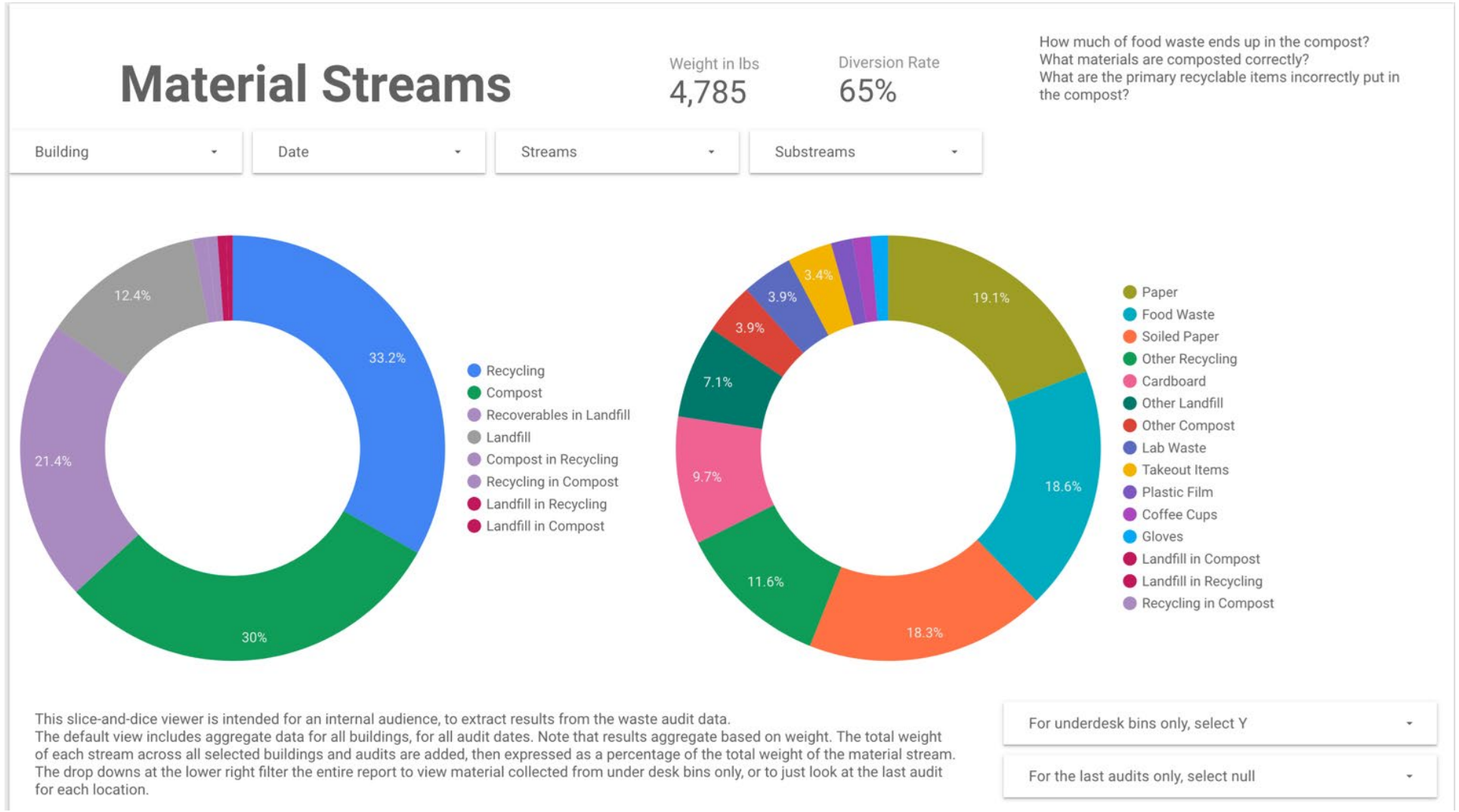
Select one building above and compare results to the average diversion at Berkeley Lab to the left

Recoverables in landfill = Items that should have gone in the recycling or compost bins but were not sorted correctly.
Results reflect the last audits completed at each building. See Page 2 for a comparison of results by building.

External View of Audit Results



External View of Waste Stream



Sorting Behavior

Contamination

Building

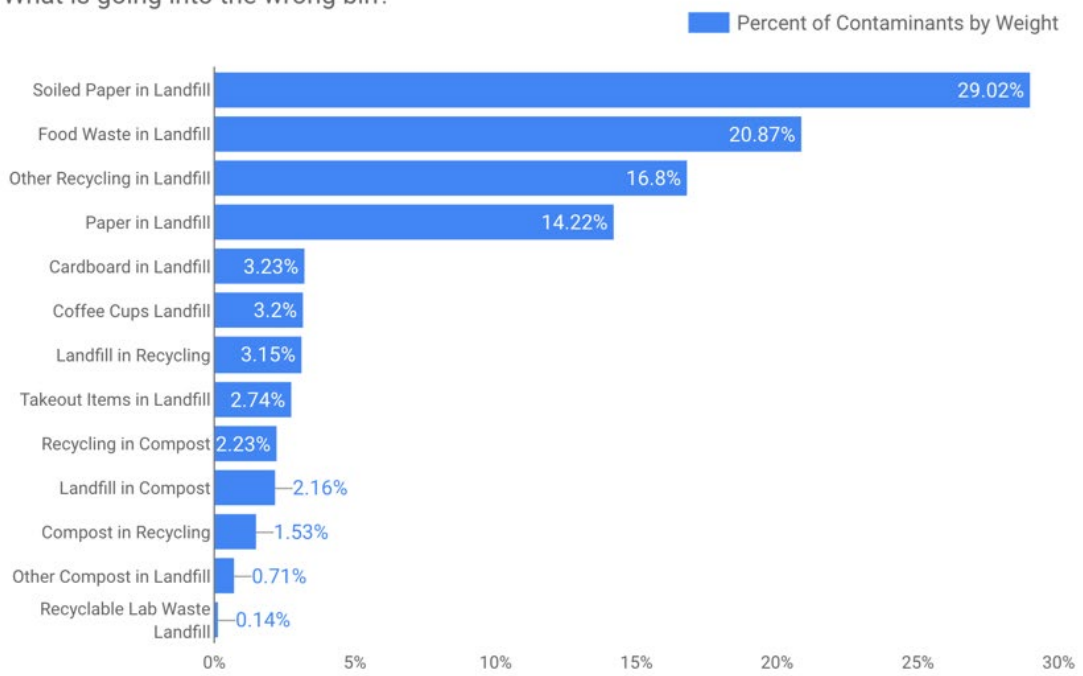
The default shows aggregate data for Berkeley Lab. You may select individual buildings above.

Contamination of Compost
2.9%

Contamination of Recycling
3.1%

Contamination of Landfill
56.7%

What is going into the wrong bin?



WASTEGUIDE.LBL.GOV
REACHING ZERO WASTE TOGETHER

Waste Guide

Select Language

What do I do with...

Other Recycling

Paper Recycling

Compost

Landfill

Lab Waste

E-Waste

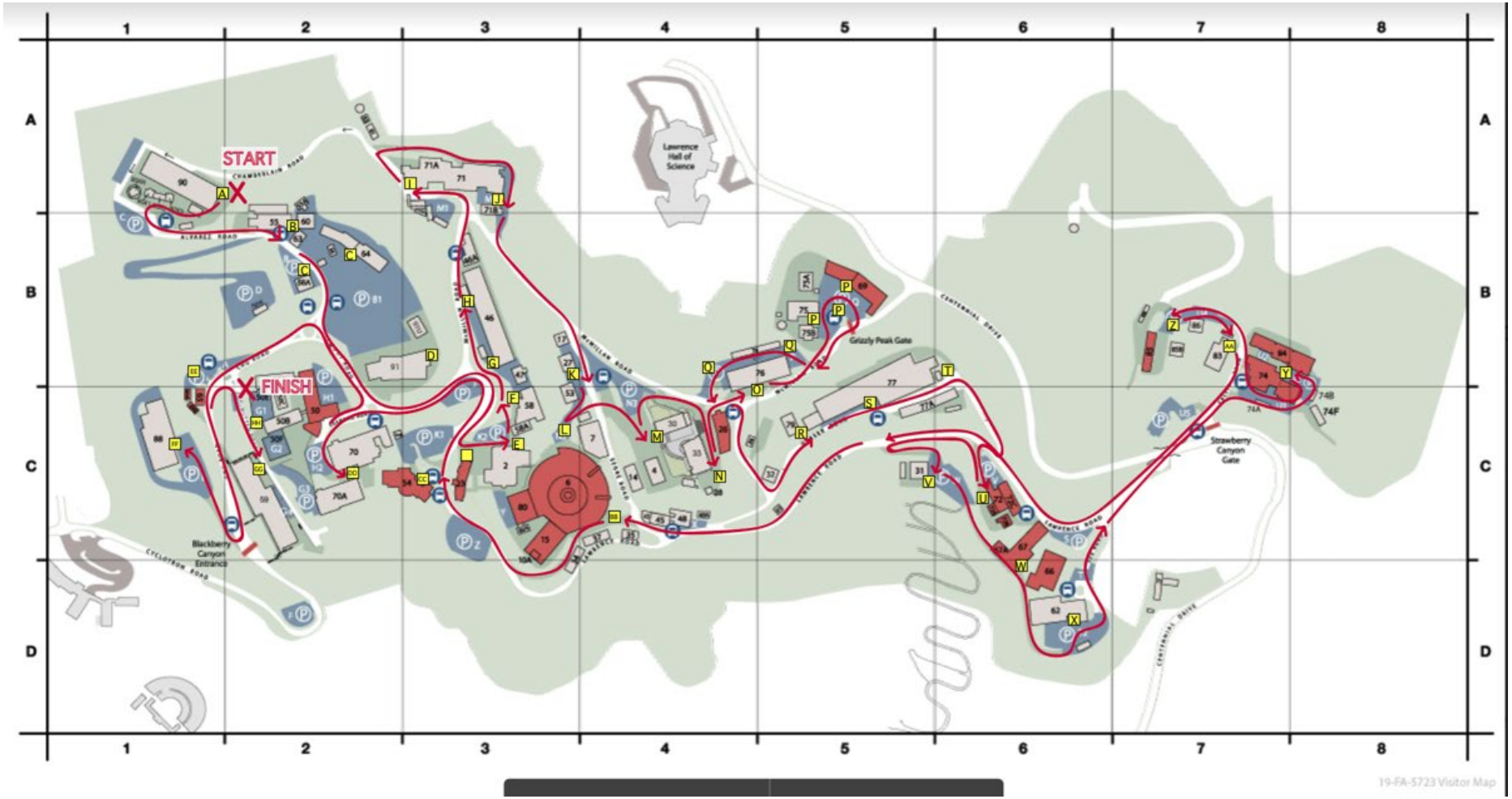
Excess Services

Special Instructions

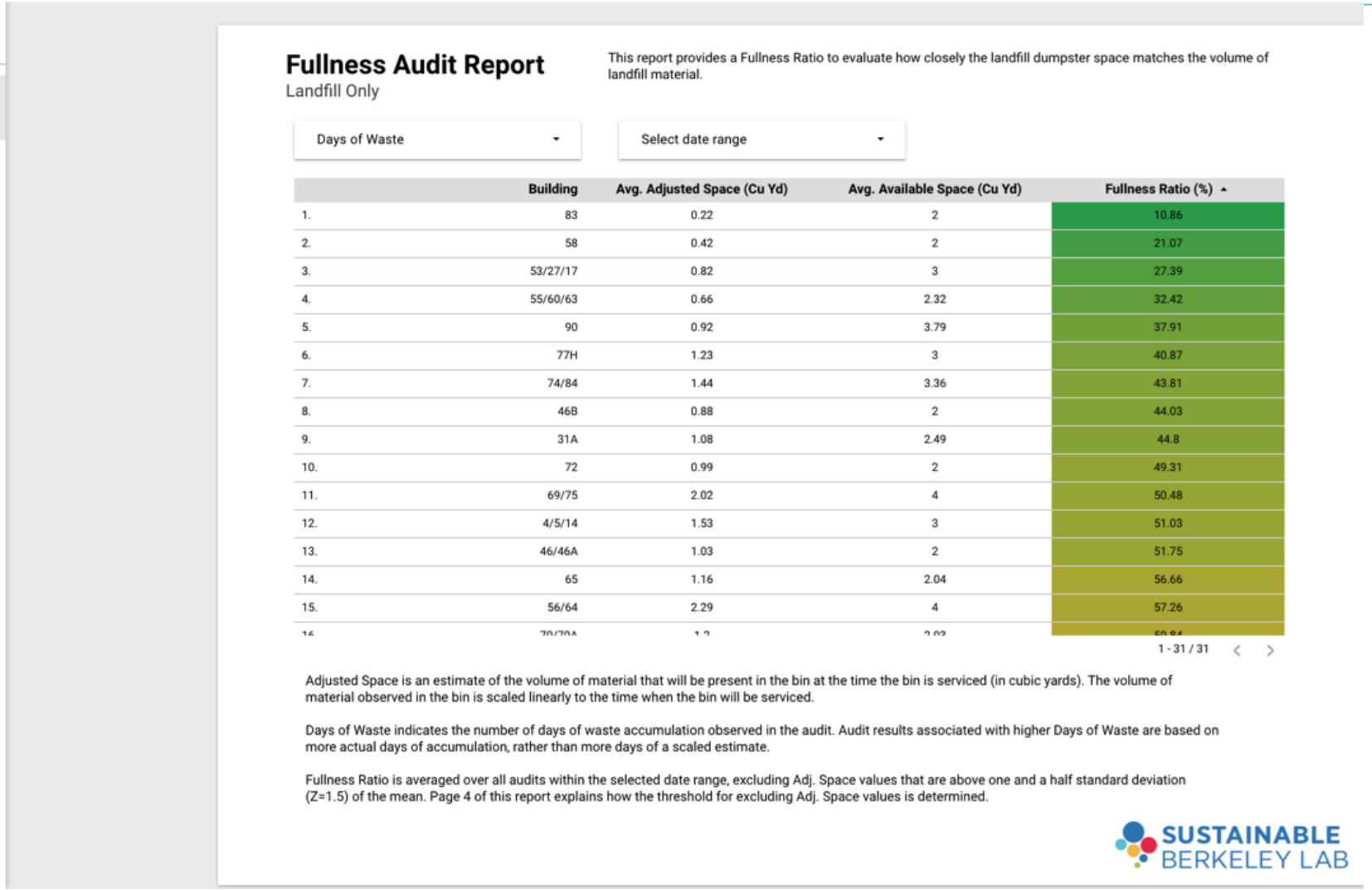
Takeout Items

Bulbs & Batteries

Site Map


START
FINISH
Lawrence Hall of Science
Grizzly Peak Gate
Strawberry Canyon Gate
Blackberry Canyon Entrance
19-FA-5723 Visitor Map

Fullness Audit Analysis



Pages

Audit Report for Landfill - including Fullness Ratio

Audit Date Results for Landfill, Grouped by Location

QA/QC: Raw Landfill Data Grouped by Location

Reference: Source of Statistics Calculation for Landfill data

Audit Report for Composting - including Fullness Ratio

Audit Date Results for Composting, Grouped by Location

QA/QC: Raw Compost Data Grouped by Location

Reference: Source of Statistics Calculation for Composting data

Fullness Audit Report

Landfill Only

This report provides a Fullness Ratio to evaluate how closely the landfill dumpster space matches the volume of landfill material.

Days of Waste

Select date range

	Building	Avg. Adjusted Space (Cu Yd)	Avg. Available Space (Cu Yd)	Fullness Ratio (%)
1.	83	0.22	2	10.86
2.	58	0.42	2	21.07
3.	53/27/17	0.82	3	27.39
4.	55/60/63	0.66	2.32	32.42
5.	90	0.92	3.79	37.91
6.	77H	1.23	3	40.87
7.	74/84	1.44	3.36	43.81
8.	46B	0.88	2	44.03
9.	31A	1.08	2.49	44.8
10.	72	0.99	2	49.31
11.	69/75	2.02	4	50.48
12.	4/5/14	1.53	3	51.03
13.	46/46A	1.03	2	51.75
14.	65	1.16	2.04	56.66
15.	56/64	2.29	4	57.26
16.	70/70A	1.2	2.02	59.84

1 - 31 / 31

Adjusted Space is an estimate of the volume of material that will be present in the bin at the time the bin is serviced (in cubic yards). The volume of material observed in the bin is scaled linearly to the time when the bin will be serviced.

Days of Waste indicates the number of days of waste accumulation observed in the audit. Audit results associated with higher Days of Waste are based on more actual days of accumulation, rather than more days of a scaled estimate.

Fullness Ratio is averaged over all audits within the selected date range, excluding Adj. Space values that are above one and a half standard deviation (Z=1.5) of the mean. Page 4 of this report explains how the threshold for excluding Adj. Space values is determined.

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Fullness Audit Report

Landfill Only

This report provides a Fullness Ratio to evaluate how closely the landfill dumpster space matches the volume of landfill material.

Days of Waste

Select date range

	Building	Avg. Adjusted Space (Cu Yd)	Avg. Available Space (Cu Yd)	Fullness Ratio (%)
17.	59	1.8	2.95	61.07
18.	88	1.86	3	62.11
19.	2	1.25	2	62.59
20.	71/71B/71A	1.27	2	63.52
21.	54	3.23	5.5	64.02
22.	85/85B	2	3	66.67
23.	50 Complex	2.27	3	75.8
24.	91	3.89	5	77.78
25.	76/78W	2.52	3.13	81.37
26.	7	2.02	2.48	81.38
27.	77/77A	2.51	3	83.79
28.	30/33	1.82	2	91.1
29.	62/66	2.52	2.64	96.13
30.	6/15/45/48/80	2.4	2.61	99.22
31.	67	3.59	3	119.52

1 - 31 / 31

Adjusted Space is an estimate of the volume of material that will be present in the bin at the time the bin is serviced (in cubic yards). The volume of material observed in the bin is scaled linearly to the time when the bin will be serviced.

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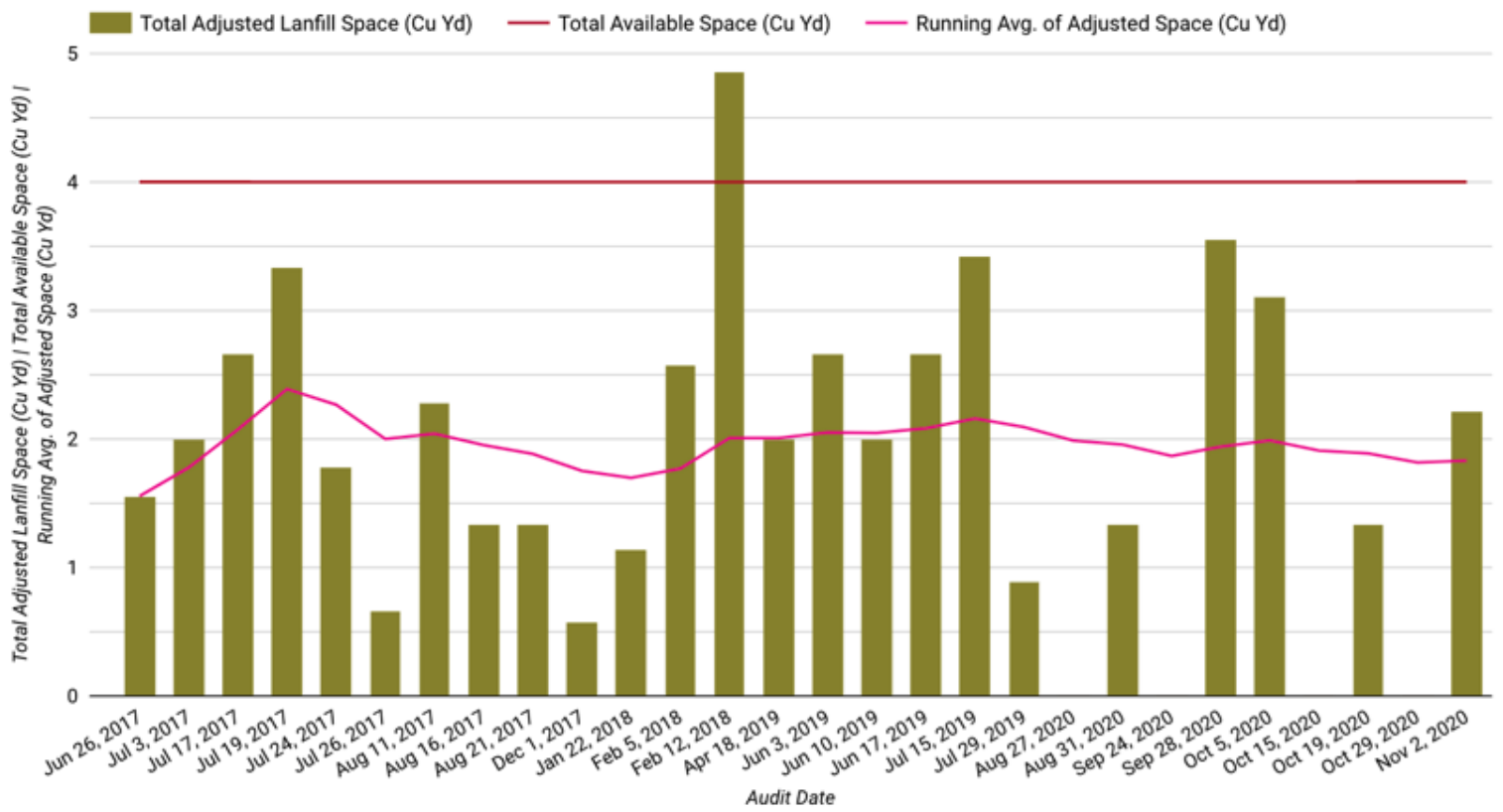
Audit Date Results for Landfill Bins

Represents a Building's Total Adjusted Landfill Space in Comparison to the Total Available Landfill Space across time series of Audit Dates.

Average Adj. Landfill Space* (Cu Yd)
1.83

Building: 69/75 (1)



*Average Adjusted Space calculation is inclusive of the above normal values of Adjusted Landfill Space.

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Mean and Standard Deviation of Adjusted Landfill Space values

Data is grouped by Buildings (Location). This table is used for determining which fullness point (Adjusted Landfill Space) is considered normal or should be excluded from the Fullness Ratio calculation. Standard Deviation and Mean of Adj. Landfill Space values is averaged over all audits, and grouped by buildings. Any value that falls above the summation of mean and 1.5 standard deviation is not considered normal and excluded or Voided from Fullness Ratio calculations.

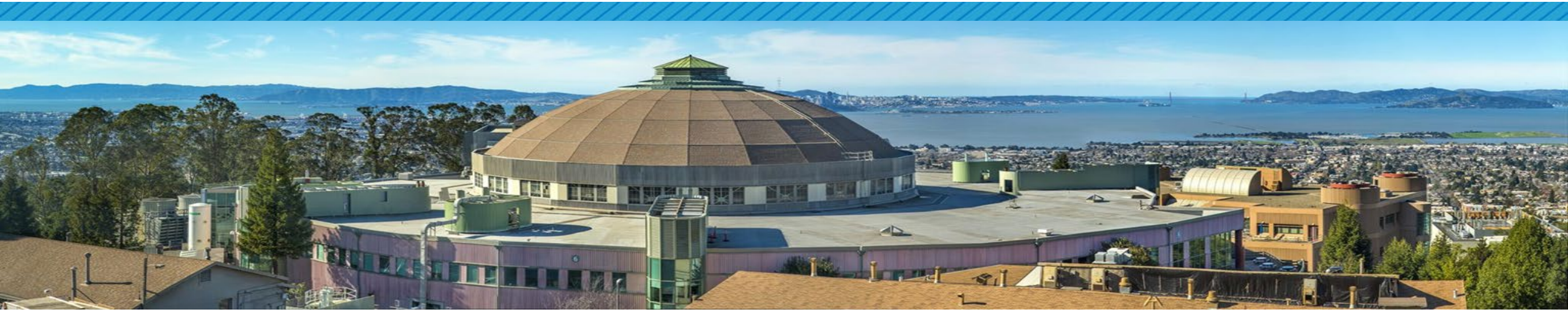
	SBLID	Building ▲	Mean of Adj. Space (Cu Yd)	Standard Deviation of Adj. Space (Cu Yd)	Mean + STDDEV (Cu Yd)
1.	1	2	1.07	0.83	2.32
2.	203	50 Complex	2.26	2.62	6.18
3.	29	54	3.15	2.63	7.1
4.	73	59	2.32	2.74	6.42
5.	41	65	1.13	1.18	2.9
6.	43	67	3.41	2.96	7.85
7.	200	7	1.73	1.3	3.67
8.	52	72	0.77	1.11	2.44
9.	67	88	1.78	1.46	3.96
10.	68	90	1.01	1.39	3.09

Dumpster Mapping

Next Steps

- Reconsider technology like that remotely monitors fullness
- Building management engagement
  - Create incentives for reporting
- Structure next waste hauling contract to have on demand pickups and other incentives

Thank You!



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Questions?

~Please utilize the chat box for questions~

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Keep in touch!
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